

Claims

What is claimed is:

1. A recombinant *E. coli* host cell containing an expression system for producing at least one nucleotide diphosphate 6-deoxy-sugar.
2. The host cell of claim 1, further comprising an expression system for expressing 6-deoxyglycosyl transferase.
3. The host cell of claim 2, further comprising an expression system for the synthesis of a polyketide.
4. The host cell of claim 1, wherein said sugar is selected from the group consisting of desosamine, cladinose, mycaminose, oleandrose, forosamine, daunosamine, mycarose, ascarylose, rhamnose, and mycosamine under conditions wherein the nucleotide diphosphate sugar is produced and the 6-deoxyglycosyltransferase is expressed.
5. The host cell of claim 4, wherein said sugar is D-desosamine.
6. The host cell of claim 1, wherein the expression system comprises desosamine biosynthetic genes from *Streptomyces venezuelae*, *Saccharopolyspora erythraea*, *Streptomyces narbonensis*, or *Streptomyces antibioticus*.
7. The host cell of claim 6, wherein said desosamine biosynthetic genes are from *Streptomyces venezuelae*.
8. The host cell of claim 7, wherein the desosamine biosynthetic genes comprise *desI* - *desVI* and *desVIII* genes.
9. The host cell of claim 8, further comprising an expression system for expressing a desosaminyltransferase.

10. The host cell of claim 3, wherein the expression system for the synthesis of a polyketide comprises genes encoding a 6-deoxyerythronolide B synthase.
11. The host cell of claim 10, further comprising an expression system for a 6-erythronolide B 6-hydroxylase.
12. The host cell of claim 11, wherein the expression system for producing at least one nucleotide diphosphate 6-deoxy-sugar comprises genes encoding enzymes that produce TDP-mycarose, and wherein the expression system for expressing a 6-deoxyglycosyltransferase expresses a mycarosyltransferase.
13. The host cell of claim 11, further modified with an expression system for an erm ribosomal methyltransferase.
14. The host cell of claim 13, further comprising an expression system for producing TDP-desosamine and a desosaminyltransferase.
15. The host cell of claim 14, further comprising an expression system for an erythromycin D 12-hydroxylase.
16. The host cell of claim 15, further comprising an expression system for an erythromycin C 3"-O-methyltransferase.
17. A method for producing a glycosylated polyketide comprising feeding a polyketide to a culture of the host cells of claim 2 under conditions wherein the nucleotide diphosphate 6-deoxy-sugar is produced and the 6-deoxyglycosyltransferase is expressed.
18. The method of claim 17, wherein the polyketide is a 6-deoxyerythronolide B.
19. A method of producing an erythromycin analog comprising culturing the host cells of claim 16 under conditions wherein the genes in each expression system are expressed to produce functional enzymes.

20. The host cell of claim 1 wherein the expression system for producing nucleotide diphosphate 6-deoxy-sugar does not comprise biosynthetic genes from *Micromonospora megalomicea*.